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ABSTRACT

The National Center for Higher Education Management Systems (NCHEMS) has completed the development and demonstration of a library statistical data base. The data base, or management information system, was developed for administrators of public and academic libraries. The system provides administrators with a framework of information and standardized data for library management, planning, and decision making; communication and comparison between libraries; and reporting to external agencies and organizations. Included in the final report are: (1) recommendations of the advisory committee to the project; (2) an overview of the pilot test of preliminary versions of selected components of the system in five Pennsylvania libraries with their recommendations for further revisions; (3) a narrative on activities related to the project in other agencies; (4) a brief overview of the conceptual approach used in the design of the systems; and (5) enumeration of seven areas where additional research is required. Appendices include a bibliography, a complete list of publications emanating from the project, evaluation report, performance measures by program areas of the system, and financial report. The framework and conceptual approach, as well as the detailed set of data structures employed in the system, are discussed in related documents. (JPF)

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FOURTH QUARTERLY REPORT

Project No. 475AH60139
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DEVELOPMENT AND DEMONSTRATION OF A STATISTICAL DATA BASE SYSTEM FOR LIBRARY AND NETWORK PLANNING AND EVALUATION

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Special thanks to Karl Pearson for his consultation and valuable contributions and to Mary Haenselman who had the time-consuming task of typing formats and definitions and numerous other administrative responsibilities so crucial to this project.

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DEFINITIONS OF TERMS AND ACRONYMS

ALA--American Library Association

ARL--Association of Research Libraries

DATA BASE SYSTEM--A structural means for collecting, organizing, retrieving, disseminating, and interrelating those data elements identified as being critical for library planning and management.

DATE ELEMENT--For the purposes of this project a DATA ELEMENT will be defined as a generic term used to describe the components and subcomponents: Program Categories, Subcategories, Sectors, and Program Elements making up the NCHEMS Program Classification Structure.

HEGIS--Higher Education General Information Survey prepared by NCES.

IEP--INFORMATION EXCHANGE PROCEDURES--"The Information Exchange Procedures (IEP) developed by the National Center for Higher Education Management Systems (NCHEMS) are a set of standard definitions and procedures for collecting information about disciplines and student degree programs, outcomes of instructional programs, and general institutional characteristics. These definitions and procedures have been developed to facilitate exchange of information among institutions of postsecondary education, providing institutions with some assurance that data they exchange are useful for purposes and comparisons." (NCHEMS, Technical Report 64, February 1975)

LIBGIS--Library General Information Survey prepared by the National Center for Educational Statistics.

NCES--National Center for Education Statistics, Office of the Assistant Secretary for Education.

NCHEMS--National Center for Higher Education Management Systems at WICHE.

OUTCOME MEASURES--Indicate the outcomes or products generated as a result of the activities of the program element. (Topping, NCHEMS, Technical Report 35, February 1973)

OUTCOMES--Results and impacts.

PCS--PROGRAM CLASSIFICATION STRUCTURE--The following terms are utilized by NCHEMS to describe the Program Classification Structure:

Program	Program Subcategory	Program Measures
Subprogram	Program Sector	
Program Category	Program Element	

APPENDIX C and TABLES I, II. and III provide illustrations of the PCS framework.

USOE--United States Office of Education

WICHE--Western Interstate Commission for Higher Education

WILCO--Western Interstate Library Coordinating Organization.

USOE QUARTERLY REPORT

For the Period
May 1, 1977 to August 31, 1977

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I. INTRODUCTION

The National Center for Higher Education Management Systems (NCHEMS), under Grant No. G007603529 from the U. S. Office of Education,¹ has completed the development and demonstration of a statistical data base system for library decision-makers in academic and public settings. The objectives of the project (as stated in the original proposal) were:

- 1) To design and develop cooperatively a statistical data base system.
- 2) To demonstrate the use of the statistical data base system.
- 3) To evaluate the developed library statistical data base system.
- 4) To disseminate the components of the new statistical data base system.

These objectives have been met successfully through the development of the end products of this project.²

In meeting these objectives the following products have been prepared:

- 1) The Commentary to Library Statistical Data Base, an overview of the framework and conceptual approach employed;
- 2) the Library Statistical Data Base Formats and Definitions, a detailed set of data structures relevant to the categorizations of information, terminology and definitions employed;
- 3) the Summary of the Pilot Test and Demonstration of the Library Statistical Data Base, an evaluative summary of findings;
- 4) a bibliography of library management information needs and statistical data, appearing in Appendix A of this report; and,
- 5) the final report for this project, documenting the process of the development and demonstration of the library statistical data base.

Products besides this final quarterly report and the bibliography are available separately from NCHEMS. A complete list of publications concerning this project appears in Appendix B.

¹with matching funds from the Western Council of State Libraries.

²A revision was made to the original proposal through negotiations with the Office of Library and Learning Resources (OLLR). Specifically, the advisory group of the project was expanded to include representation of state libraries, networks and the ALA statistics committees, in order to achieve a wider base of input and review of the data base development. To accommodate the financial expenditures resulting from this expansion, OLLR agreed to curtailing the demonstration aspects of the project to the academic community.

These final products are intended to provide a sound information base for (1) library management, planning and decision-making, (2) communications and comparisons between libraries, and (3) reporting to external agencies and organizations.

This is the fourth and final report of the project. The project was initiated in July 1976. Earlier quarterly reports document the activities conducted throughout the duration of the project.

II. THE PROBLEM

There is no longer a debate over the need for useful management information. Organizations have become increasingly complex, and the costs of collecting extensive data about the organization are prohibitive. Thus, a system of "selected" information providing the pieces necessary for informed decision-making is required. The situation for the library manager is no exception. Logical and consistent data sets are required to guarantee against information overload or information insufficiency.

Currently, service demands placed upon the library are becoming more sophisticated and more diverse. In response, the library manager has been forced to expand, renovate or refine programs. Simultaneously, resources available to the library community have diminished, and competition for funds with other service providers has increased. These trends, coupled with demands for accountability and service-relevancy, require that the library manager enhance and publicize the impacts of the library service to funders and constituents.

Moreover, the growing complexity of library operations has confronted the library manager with more difficult decisions in resource allocation, resource sharing, and operations revision. Solutions are obscure, and the outcomes of these decisions are not easily measurable. The decision maker must examine a series of alternatives and be sensitive to the reverberating effects of any decision. Such decisions require an information system which is easily interpretable, thorough, and amenable to differing algorithms for resource allocation, service provision, and organizational structure.

Management information needs are not the only impelling factors in the development of a standardized system of data and data combinations. Other inducements warrant discussion: communication and comparison among similar institutions; the data requirements of external library data collectors; and, the quantitative standards prescribed for various types of libraries.

There is no objective ruler, such as profit, by which the library can measure its performance. Basic to performance measurement within libraries is comparison with other similar libraries. Presently, such comparison is impeded by the nonexistence of a communications mechanism whereby libraries can exchange data. This situation is primarily fostered by the lack of a common language, with accepted terminology and definitions,

through which data could be exchanged among libraries. Such communication is further hindered by the absence of standard formats which would facilitate the exchange of meaningful and consistent data combinations or measures.

Currently, the library is required to report data to a variety of outside agencies -- associations, organizations, state and federal offices. This complex of data collectors has failed to interface, and have required different sets of data, differing measures, and forwarded diverse definitions for similar terms. Consequently, the library has been overburdened by data collection. Largely, this has been due to the nonexistence of standard data terminology, and the inability of many of these external agencies to articulate their information requirements. For example, state and federal level agencies need to know the types and level of demand for library service by individual citizens; the characteristics of library service necessary to respond to the individual and collective need; the kinds and amounts of resources required to support library service; the status and results of developing networks; and, the basis for equalization of service to all citizens and the future financing of library service. To date, the data required to address these information needs have been elusive, unidentified, or merely ignored. A specified and standard set of data needs to be identified in order to meet these requirements.

Finally, the library community itself requires consistent and meaningful information. Professional and external groups (such as accreditation teams) are in the process of developing quantitative standards for various types of libraries. These standards require data about the library and its operations. Historically, such standards have been built upon inventory and population statistics. Two basic problems have been inherent: The relevancy of these quantitative standards to the effectiveness of the library has not been established; and, the inadequacy of definitions for library terminology employed by these standards have prevented comparability among libraries. These obstacles prevent universal subscription to the standard.

Underlying these circumstances has been the failure to identify data needs -- for management information, for information exchange, for external library data collectors, for standards development. The results of these approaches have been haphazard and ineffectual, yielding, at best, inconsistent data, and at worst, misleading and faulty statistics.

III. GOALS

The goals of the project, as interpreted by project staff, and as identified as encompassing the objectives of the project and meeting the problems of library management information outlined above, are summarized as follows:

- 1) To identify, categorize and define specific data needed by the library manager: The isolation of relevant information requirements of the library manager for internal management, comparison and communications with other libraries, and reporting to external agencies and organizations.
- 2) To structure data into a meaningful framework useful to library management: The development of an overall structure and approach to the description and assessment of a library, its programs and its resources.
- 3) To develop standardized data display formats consistent with internal needs and external requirements: The design of data structures which combine data into useful sets of information as a tool for management and a facilitator of data exchange.
- 4) To test the data structure in library settings: To provide feedback on the usefulness and value of the system of information through a pilot test of the data base.

IV. METHODOLOGY

In order to meet the goals and objectives of this project, the following major tasks have been undertaken and completed during the course of this project:

- The creation and utilization of communications mechanisms within the library community: The project has sought to employ an advisory group representative of the library community, a specially sponsored group on library performance representing researchers within the library profession, statistics committees of the American Library Association, and concurrent research projects dealing with library management information.
- The development of a conceptual approach to library management information: Drawing upon the input of various sources within the library community, and from the continued refinement of the library statistical data base, NCHEMS has developed an approach to what a library is -- a set of resources -- and, what a library does -- a set of activities.
- The design of a structure of information consistent with the conceptual approach, and consistent with the concerns voiced by the library community: Based upon the dual nature of the library as a set of resources and a set of activities, NCHEMS has developed a series of data formats which serve to describe and assess the environment, the resources, and the programs of the library for the manager of a library in an academic or public setting.

- The compilation and definition of terms employed in the structure of information: Drawing upon the definitional sources presently employed in the library community, and upon the input of various persons within the library community, NCHEMS has compiled the definitions for terms employed within the formats, providing a basis for standardized vocabulary of data necessary for management information.
- The demonstration and pilot test of the structure of information in the academic community: In order to determine the usefulness of the library statistical data base, five academic institutions utilized the information structure, and evaluated its value to library management.
- The analysis and interpretation of pilot test results: As a result of the pilot test, data collected as well as the evaluation submitted by participating libraries were analyzed to determine areas of potential revision, reduction of data requirements, and patterns of data exhibited among the libraries; in addition, data obtained from the Council for the Advancement of Small Colleges (CASC) were used to examine patterns among 43 small college libraries.
- The dissemination of the resulting structure, and current findings: Due to the evolving nature of the information structure, the data base documentation will receive wide distribution with a continued mechanism for feedback from the library community; in addition, the data base will receive "popular" dissemination through presentations and journal publications.

An evaluation of the data base, and the methodology employed, appears in Appendix C of this report. The report was submitted by Dr. Scott Brunton of Shippensburg State College, Pennsylvania.

V. MAJOR ACTIVITIES DURING THE PERIOD May 1, 1977 THROUGH AUGUST 31, 1977.

A. Advisory Group

A major communications link with the library community has been the advisory group established for this project. The group has met three times during the year. The primary responsibilities of the group are to review, revise and supplement efforts in the development of the statistical data base. Members of the advisory group are:

- Robert Burns, Colorado State University
- Ronald Dubberly, Seattle Public Library
- Katherine Emerson, University of Massachusetts
- Anne Marie Falsone, Colorado State Library
- Harold Olsen, California State University, San Jose
- Vernon Palmour, King Research
- Frank Schick, National Center for Education Statistics
- Donald Simpson, Bibliographical Center for Research
- Barbara Slanker, American Library Association
- Duane Webster, Association for Research Libraries

During the fourth quarter, the advisory group met in Boulder, Colorado on July 14 and 15. The specific purposes of this meeting were to: 1) review the status of the project; 2) discuss the purposes and needs for future development; 3) determine the best method for achieving the intended results of the current project; 4) outline the final products of the project; 5) examine performance measurement; and, 6) assess the preliminary findings of the pilot test. Also attending this meeting were Willis Hubbard, Stephens College, and Nicolas Osse, the National Center for Education Statistics. The general consensus among meeting participants was that NCHEMS should foster wider dissemination of the overview document, Commentary to Library Statistical Data Base; that, in general, the formats and definitions addressed the needs of library managers in academic and public library settings; and, that remaining concerns with formats and definitions would best be resolved through further testing.

B. The Reference Statistics Committee of ALA Library Administration Division, Library Organization and Management Section

In order to determine the flexibility of the library statistical data base, one program area -- Information Services -- was selected for experimental expansion within the system. During this development, the assistance of the Reference Statistics Committee of ALA provided a technical and review basis. A discussion paper discussing potential expansion and relevant data requirements was prepared by NCHEMS staff, and reviewed by members of the Reference Statistics Committee. The comments received through this review were incorporated into the revisions made to The Library Statistical Data Base -- Formats and Definitions. Although these formats and definitions prepared for Information Services within the data base are still considered developmental, the input of both the committee members and the pilot test has provided a sound basis for this expansion. Specific concerns addressed by the Reference Statistics Committee were the level of detail and amount of data collection required by the formats; the appropriate categorization and refinement of reference transaction types; the description of the reference collection; and, the need for optional levels of detail. Major revisions precipitated by this review were: The retitling of Information Services from Materials Identification/Access; Community Referral refolded into Reference Services; the expansion of Information Services to include instruction in the use of the library and library resources; the identification of several types of Reference Transaction. The standard definitions of reference transaction, directional transaction and group transaction as forwarded by the Reference Statistics Committee and as employed by LIBGIS remain the fundamental basis of reference activity measurement. However, beyond this, the data base offers secondary and tertiary levels of detail, particularly of the reference transaction category. Reference Transactions were secondarily divided into: Catalog Information Transactions; Readers or Research Advisory Transaction; Literature Search Transactions (of the collection, of machine-readable bibliographic data bases, and of other sources); Fact-Finding Transactions; Community Referral Transactions; and other transactions. These were measured by duration intervals (e.g., less than five minutes, five to fifteen minutes, etc.) and by service point of the transaction. Further refinement was limited to fact-finding transactions

(measured by source of answer, and source of assistance) and literature searches (measured by data base, entries produced and results of search in circulation transactions and interlibrary loan borrowing requests). Additionally, selective dissemination of information activity and special bibliographies and catalogs produced by library staff are examined within the data base.

The reference collection was measured both in physical dimensions -- determined by format and physical units represented by the collection -- and in intellectual dimensions -- determined by the types of holdings represented in the collection. The latter measurement proved problematic due to the underlying differences typically found between the general collection and reference collections of a library. Also, there are material types of particular importance within the reference collection which are not measured within the general collection. Such measurement proves difficult when comparing libraries due to varying policies of reference collection development. However, as an initial attempt at describing the contents of reference collections beyond format (i.e., print and nonprint), the collection was divided into the following categories: Publishers' and Book Trade Lists; Indexes and Abstracts; Bibliographies; Catalogs; Fact-Finding Sources; and, other reference collection materials.

In general, all comments received by members of the Reference Statistics Committee were incorporated in the latest edition of The Library Statistical Data Base Formats and Definitions.

C. Pilot Test

To assess the utility and feasibility of the management information system, five Pennsylvania state colleges pilot tested a major portion of preliminary versions of the data formats and standard definitions forwarded by NCHEM. Through the results of the pilot, sets of data and descriptors employed in the system were refined and improved. The five libraries participating in the pilot were:

- East Stroudsburg State College
- Indiana University of Pennsylvania
- Lock Haven State College
- Mansfield State College
- Shippensburg State College.

The pilot test was directed by Dr. Scott Bruntjen of Shippensburg State College.

The primary reasons for pilot testing the data base structure were to determine: the feasibility and utility of data collection; the accuracy and clarity of definitions employed by the data base; the reasonableness of the costs for such data collection; the sophistication of existing data systems within libraries; and, areas within the data base for improvement.

A meeting prior to the pilot between NCHEMS staff and Dr. Scott Bruntjen was convened to review strategies of the pilot, and determine the extent of evaluation or feedback necessary on the pilot. Without prior training or assistance, each of the pilot test libraries received an abbreviated publication of the Formats and Definitions. This document contained only formats and definitions, and no instructional materials were included. Dr. Bruntjen fielded all questions regarding the formats, and it was not necessary during the course of the pilot to consult with NCHEMS staff. Additionally, Dr. Bruntjen designed an evaluation instrument which was completed by each of the participating libraries, and addressed each data element within the pilot test instrument. The evaluation instrument addressed: the clarity of definitions and formats; the difficulty in collecting the data; the value of the information (cost of data collection versus value of information); and any other comments about the data element which influenced the quality of the data base.

At the time of the pilot test the present structure of the data base (separate components for resources and programmatic categories) was not yet developed. The only resource category examined within the pilot test libraries was collection. Program measures examined were: financial, personnel, and activity. These areas of investigation were selected (1) because of their importance to the structure, and (2) because other data collection efforts -- such as the National Center for Education Statistics' Higher Education General Information Survey (HEGIS) -- did not collect these data (i.e., verifying that the information was generally available and collected by libraries).

Data required for the fiscal period covered by the report were obtained from existing statistical reports maintained by the library or the institution. Since no changes were made to existing data systems (nor encouraged) in anticipation of the pilot test, the availability of these data varied from institution to institution. Therefore, evaluation of these data elements were varied significantly. Other types of data required, primarily for activity measurement, were based on one week observations. This procedure was to simulate "typical week" data collection employed by HEGIS/LIBGIS surveys. The pilot test was initiated in the late spring of 1977; consequently, data collected on "typical week" are not considered baseline data, nor was it NCHEMS intent to gather such information.

Due to the untried nature of much of the data collected during the pilot, and the possible misinterpretation of resulting information, it was agreed prior to the pilot that data collected would remain substantially confidential. Data collected, however, were analyzed by NCHEMS staff to determine what data requirement reductions were possible in future iterations of the data base, what data elements could be consolidated, what data combinations were worthwhile and meaningful, and what data constituted essential elements within the data base.

Although the data base system has now been tested within the academic library community, the test was highly selective. The data base itself was evolving simultaneous to the pilot test. In addition, the data base has been further refined since the pilot, and as a result of many of the findings of the pilot. Therefore, it is the recommendation of NCHEMS that further testing is necessary prior to implementation and adoption of the library statistical data base generally within the library community.

The general finding of the libraries in the pilot test was that although the data base needed certain revisions and refinements, it represented a valuable and necessary management tool for library decision-making. Specific recommendations of the pilot tested libraries were that:

- Data requirements within the system need to be reduced before the system can be cost-effective.
- A tool for staff time analysis (similar to the faculty analysis tool developed by NCHEMS) is needed to determine present allocations of personnel across programmatic categories.
- An indication of optional aggregations of data would counter-balance extensive and detailed data requirements.
- The use of the "typical week" for activity measures fosters noncomparability of data among libraries by allowing the library to select dates; specifically chosen dates, or specified sampling procedure may be more appropriate.
- Future refinement of the data base should include consideration of deferred costs (e.g., cost of recataloging abbreviated cataloging), and penalty costs.
- The data base needs to accommodate explanation (e.g., footnotes) of the data included.

Finally, it was discovered during the course of the pilot test that each participant maintained different sets of data, varying from exacting detail to minimal information. Similarly, the accessibility of data maintained by the institution to the library manager varied with institution. In this sense, the data base acts as a tool in standardizing the record-keeping of institutions, and the information maintained by the library manager. An evaluation of the pilot test appears in Appendix C.

The public library component of the data base was not tested in public libraries during the course of the project. However, public library data formats and definitions were generally reviewed within the library community, and are believed to be useful in this setting.

A detailed discussion of the pilot test appears in The Library Statistical Data Base Demonstration and Pilot Test.

D. Council for the Advancement of Small Colleges Research and Management Project Task Force

Throughout the library statistical data base development, NCHEMS has fostered a cooperative relationship with the CASC Research and Management Project Library Task Force, chaired by Willis M. Hubbard. The CASC project Library Task Force collected data from 43 small college libraries for the purpose of obtaining median distributions of library budgets among salaries and wages, library materials, and other expenditures. This provided an overview of productivity in terms of resources consumed at these libraries. As a result of the extensive survey conducted by the Library Task Force, data on operations and staffing of participating academic libraries were provided to NCHEMS for purposes of further examining relationships of expenditures and activity. In examining many of the data points, along with the data collected from piloted libraries, NCHEMS was sufficiently able to isolate meaningful relationships between data categories. For the most part, data collected by CASC are less refined than that of the Pennsylvania pilot test. Additionally, most of the libraries participating in the CASC survey represent the end points of a distribution which would need data from the larger academics to verify certain indicative relationships. Information areas examined by NCHEMS included: library expenditures in relationship to institutional expenditures, expenditure patterns, staffing patterns, collection growth and effectiveness, activity patterns, and use levels. Detail of the analysis is discussed in the Library Statistical Data Base Demonstration and Pilot Test.

VI. MAJOR FINDINGS

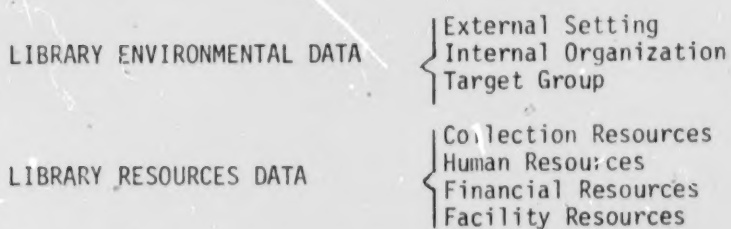
A. Redefining the Approach to a Library

Defining a library, and, thus, an appropriate approach to a library, has been fundamental to the development of the library statistical data base. At the core, the library is a set of resources -- a collection of materials, of persons, of facilities, and of financial assets. These resources combine to carry out the activities of a library -- i.e., the programmatic functions -- or what a library does. In previous approaches to the library, this dual characteristic of a library as a set of resources (potential) and as a set of programs (actual performance of the resources) has been largely ignored in the description and evaluation of a library. NCHEMS has chosen to distinguish these roles within the library statistical data base. Another set of data which are neither program nor resource data serve to describe the library -- the environment in which the library exists. Environmental data serve to characterize the internal and external relationships existent in the library setting, and to isolate those factors which influence the use or nature of the library resources or programs. Figure 1 presents an overview of the structure of information as it has been developed in the library statistical data base.

Figure 1

SUMMARY OF
MANAGEMENT INFORMATION SYSTEM FOR LIBRARIES

Organizational Goals and Objectives



PROGRAM DATA

Programmatic Activities (Functions)	Categories of Measures	Revenue/Expenditure Measures	Personnel Measures	Facilities Measures	Activity Measures	User Measures	Outcome/Performance Measures
Administrative Services							
User Services							
Technical/Production Services							
Instructional Services							
Support Services							

The resources of the library are described in terms of physical dimensions -- i.e., numbers and types -- and in terms of quality. Quality is measured differently for each resource. For instance, the collection is measured in terms of intellectual dimensions (breadth and depth), relevancy (age of collection, core collections represented, etc.) and accessibility and availability of information within the collection. Human resources are examined on the basis of educational background, stability of workforce, and so forth. Facilities are examined on the basis of the condition of the building, the availability of seating and shelving and the types of building facilities available.

The programs of the library are measured in terms of resource utilization (i.e., fiscal, human and facility resources employed) and the activity generated from this resource utilization (e.g., number of acquisitions, of circulations, of interlibrary loans, etc.) Finally, these programs are evaluated by the performance of the activity. Outcome and performance are perhaps the most difficult measures to derive. Within an academic institution, the outcome (result or impact) of library services cannot be divorced from the impact of instruction within the institution. Performance, on the other hand, is largely dependent upon the objectives established by the individual library. NCHEMS has focused primarily upon performance measurement, building upon the findings of an outcomes measurement meeting held in April, and documented in the third quarterly report. NCHEMS feels that this area within the statistical data base is still evolving, and will require further refinement as performance variables within library program areas are isolated and identified.

B. Identification of Programmatic Functions of the Library

Throughout the project the program activities of a library have been isolated, defined and refined. As a result of the advisory group examination, the activities of organization and personnel development (a subactivity of Administrative Services) were separated from the general administrative services of the library. This enables the library manager to determine the amount of resources devoted to the management of the library away from those activities devoted to the development of the institution of which the library is a part, and the staff training and development function carried out or supported by the library. The review by the Reference Statistics Committee provided a basis for an expansion of the definition of Information Services, incorporating those instructional activities devoted to the intelligence of library resources and operations. Initially such activity had been considered under Instructional Services.

An overview of the three levels of programmatic categories used within the data base appears in Figure 2.

Figure 2
LEVELS OF PROGRAMMATIC ACTIVITIES

LEVEL 1	LEVEL 2	SELECTED PROGRAMS UNDER LEVEL 2
Administrative Services	General Administrative Activities	- Management - Fiscal Operations - Public Relations & Development - Personnel Services - Planning
	Organizational & Personnel Development Activities	- Personnel Development - Organization Development
User Services	Materials Distribution	- Circulation Services - Reserve Services - Media Distribution Services - User Copying Service
	Information Services	- Reference Services - Clientele Directional Service
	Interinstitutional Exchange & Loan Services	- Interlibrary Loan Service - Interinstitutional Delivery
Technical/ Collection Services	Collection Development	Collection Development Services
	Materials Acquisition	- Searching/Verification - Acquisitions Services/Ordering - Gift/Exchange Services
	Materials Organization and Control	- Cataloging Services - Periodical Check-in Services - Catalog Maintenance & Production
	Materials Preparation/ Production	- Binding & Repair Services - Physical Processing - Media Production Services
Instructional Services	General Instruction Activities	- General Education Programs - Public Information Programs - Special Services Programs
Support Services	General Support Activities	- Logistical Services - Physical Plant Operations

C. Performance Measurement

As discussed earlier, performance measures incorporated within the data base are still considered developmental. NCHEMS has provided a shopping list of selected measures possible, and exemplary of performance measurement. The measures thus far developed are based on the isolation of several performance variables considered useful to the measurement of performance in any program area of the library. These performance variables are:

- Policy Effectiveness
- Budgetary Control
- Work Environment/Staff Morale
- Staff Competence
- Operations Effectiveness
- Productivity
- Accuracy
- Timeliness

Each of these variables dictate different types of measures for each program area. An overview of the performance measures presently proposed within the data base is presented in Appendix D. Many of these measures are derivable from the measures of activity, resource utilization or resources measured by earlier components described within the data base. However, a number -- such as accuracy of circulation files, etc. -- require special surveys conducted by the library adopting some of these measures. It is not proposed at this time, however, that the performance measures indicated in Appendix D be adopted wholesale. As mentioned earlier, performance depends largely upon the library's own objectives, and performance measurement should conform to these objectives. Secondly, it is believed that continued research into the area of performance measures for libraries, and into the identification of results of library service is necessary before a package of performance measures becomes useful to the library community generally.

VII. RELATED ACTIVITIES

During the fourth quarter of this project the following related activities were of significance: Presentation to the ALA Statistics Coordinating Committee on the progress of the project; Submission of a paper to the American Society of Information Science (ASIS) for presentation this fall at the ASIS annual conference in Chicago, Illinois; Preparation of a presentation for the North Dakota Library Association on the library statistical data base which is to be implemented among academic libraries in North Dakota.

During the annual conference of the American Library Association, a progress report on the project was made to the ALA Statistics Committee informing members of the progress of data base development since the last presentation at the midwinter conference.

At the ASIS annual conference, the Special Interest Group (SIG)/Library Automation and Networks (LAN) is sponsoring a program on Analysis of Library Networks: Methodologies and Implementation. A paper derived primarily from the development of the library statistical data base will be presented on data requirements for networking.

During the current year, Verrion E. Palmour has been working with the academic libraries of North Dakota in developing a system of information applicable to state-wide needs and library management within the academic community. As a result of this project, the North Dakota libraries will be working toward implementing the library statistical data base. A workshop/preconference to the North Dakota Academic Libraries Association is to be held at which the implementation of the statistical data base will be discussed and planned. NCHEMS will be involved in the pre-conference providing guidance on the issues involving implementation, and the potential uses of information from the data base.

VIII. FUTURE RESEARCH REQUIREMENTS

The library statistical data base is continually evolving and adapting to the needs of the library manager. The present design and approach is a sound beginning for a structure of information necessary for library managers in variety of settings. However, there are many areas of development which have not been explored within the context of this project. Of particular importance to ongoing development are: (1) the refinement of performance measures; (2) data uses; (3) further testing in the public library community, and in large academic libraries; (4) expansion of certain program areas (such as has been performed within Information Services); (5) construction of interfaces between the library management information system, and state and federal data systems; (6) implementation in public and academic libraries; and, (7) development in special, school and state libraries.

Many issues are addressed through implementation of the system in public and academic libraries. NCHEMS would hope that such concerns as data uses, performance measurement, and the appropriate levels of detail within the data base might better be defined through actual working environments of the data base. Performance measurement also will be refined as the state-of-the-art within which library research is advanced.

Through outlining interfaces between local data systems and those of federal and state agencies, there is a potential for the combination of data requirements among these various levels of data collection. Further with the standardization of information requirements, data uses in standards development should be significantly assisted.

IX. DISSEMINATION ACTIVITIES

The Commentary to the Library Statistical Data Base which provides an overview to the approach and structure of the data base received a wide distribution, including the Western Council of State Libraries. A complete list of persons receiving the Commentary can be found in Appendix F of this report.

In addition, a journal article providing an overview of the library statistical data base along with a companion article by Dr. Scott Bruntjen on management information needs and data uses is in preparation and will be submitted to the Library Journal for possible publication.

A list of reports published as a part of the Library Statistical Data Base project appears in Appendix B.

X. STAFF UTILIZATION

No staff changes have occurred during the fourth quarter. Staffing allocations and utilization are the same as those indicated in earlier quarterly reports.

XI. FINANCIAL REPORT

The financial report for the period May 1, 1977 to August 31, 1977 appears in Appendix E.

APPENDIX A
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APPENDIX B
LIST OF PUBLICATIONS

LIST OF PUBLICATIONS

1. Commentary to Library Statistical Data Base, publication # 2B144
2. Library Statistical Data Base Formats and Definitions, publication # 2B145
3. Pilot Test and Demonstration of the Library Statistical Data Base, publication # 2B146
4. Development and Demonstration of a Statistical Data Base System for Library and Network Planning and Evaluation, First Quarterly Report, publication # 2B138
5. Development and Demonstration of a Statistical Data Base System for Library and Network Planning and Evaluation, Second Quarterly Report, publication # 2B140
6. Development and Demonstration of a Statistical Data Base System for Library and Network Planning and Evaluation, Third Quarterly Report, publication # 2B143
7. Development and Demonstration of a Statistical Data Base System for Library and Network Planning and Evaluation, Fourth Quarterly Report, publication # 2B147

The above publications may be ordered from:

Publications Unit
National Center for Higher Education Management Systems
P.O. Drawer P
Boulder, Colorado 80302

APPENDIX C

EVALUATION OF THE LIBRARY STATISTICAL DATA BASE PROJECT

SUBJECT: Evaluation of the Library Statistical Data Base Project

TO: Maryann Kevin Brown, Senior Staff Associate, WICHE

FROM: Dr. Scott Bruntjen, Project Director, Council of Pennsylvania State
College and University Library Directors

1. General

This memorandum describes the conduct of a field test of the Library Statistical Data Base and the highlights and the lessons learned as a result of this experience. While there are some changes that should be made, the general finding is that this data base project encourages the collection and interpretation of management information at the individual library level that should be a valuable aid for decision making especially in times of shrinking resources.

2. Description of the test

Five Pennsylvania State Colleges ranging from the smallest (2,400 students--no graduate programs) to the largest (12,000 students with programs through the PhD) were involved with the initial drafts and discussions about the document. Librarians at these schools submitted preliminary reviews through the project coordinator. In April, 1977 the pilot test document, which incorporated several of the key questions, was brought to a meeting of those persons who were to be involved with the test by Maryann Brown in an on site visit at Shippensburg. The time period 1 May -- 10 July, 1977 was selected as a test schedule. On 22-24 July, 1977 Dr. Bruntjen met with WICHE staff in Boulder to review the test results.

The test was to accomplish three major objectives:

- a.) To attempt as much as possible to actually answer each question.
- b.) To evaluate the cost of data collection, the utility of the answers (at the local level), and to evaluate the general language, directions and formats used.
- c.) To determine if the document as developed can be used in the field without an inordinate amount of specialized training.

3. Summary of lessons learned

a.) With a few exceptions the definitions and directions, as provided, are complete and easily understood.

b.) The formats have some necessary data elements missing while, in some other cases, some are too detailed.

c.) The underlying structure of the document which, (by sorting out the relationships of library environment, assets, and performance) begins to permit a new conceptualization of libraries. This advance alone is probably worth the cost to date.

d.) The structure, with its attendant definitions and report formats, begins to permit the local library manager to assess his/her current position and to plan for the future. The project has the promise of providing management information in a manner that one would want it.

e.) The apparent compatability of this system (through its ability to aggregate) appears to support regional/national reporting as well as local needs.

4. It is apparent that this project represents a sound beginning but it is not a finished product. Work needs to be done in several areas including some definitions and formats, the development of performance measures, the establishment of base line data, an assessment of the correspondence of mid-sized academic libraries with other types and sizes of libraries, and the development of a training project.

5. This project represents a sizable step forward; it should not stop here.

APPENDIX D
PERFORMANCE MEASURES BY PROGRAM AREA

PERFORMANCE MEASURES BY PROGRAM AREA

PROGRAM AREA	PERFORMANCE VARIABLE	PERFORMANCE MEASURE
ADMINISTRATIVE SERVICES	MANAGEMENT	Productivity — Amount of activity performed (materials distributed, users served, etc.) per dollar of expenditure or service month of personnel. Resource Acquisition — Percent of grant applications awarded Percent increase of current year revenues over previous year Work Environment — Average number of sick days taken per employee Employee turnover rates Number of grievances filed by library employees Operations Effectiveness — Employee satisfaction with communications within departments and between departments and administrative services
	FISCAL OPERATIONS	Budgetary Control — Percent of total budget spent during fiscal year Accuracy — Error rate of fiscal transactions Error rate of fiscal records Timeliness — Number of days elapsed before the end of month fiscal reports are available Percent of discounts realized
	PERSONNEL SERVICES	Timeliness — Number of service months of authorized positions which were unfilled Average delay between position authorization and first day of work for employee filling position
	PLANNING	Policy Effectiveness — Availability of a long-range plan for library Number of times the plan has been reviewed
	PERSONNEL DEVELOPMENT	Operations Effectiveness — Employee satisfaction with staff development program Supervisors' evaluation of improved performance/competence of employees who have participated in staff development activities Percent of employees who voluntarily participate in staff development activities Number of persons advanced in rank or position or given merit salary increase due to training provided versus total number of participants in training program
MATERIALS DISTRIBUTION	CIRCULATION SERVICES	Policy Effectiveness — Percent of items demanded that are on long-term check-out Median number of days books are overdue Percent of recalls and requests for materials in general circulation Percent of circulations that are renewed User satisfaction with circulation policies Operations Effectiveness — Percent of items missing from general collection User satisfaction with circulation operations Accuracy — Percent of items misshelved Error rate of circulation files Timeliness — Lag time from return of circulated materials until discharged, sorted and reshelfed
	RESERVE SERVICES	Policy Effectiveness — Overdue rate of reserve items Percent of items demanded that are checked out Percent of reserve circulations that are renewed Percent of materials in reserves that have not been circulated Operations Effectiveness — User satisfaction with reserve operations Accuracy — Error rate of reserve list records
	USER COPYING SERVICES	Budgetary Control — Operating surpluses/deficits arising from provision user copying services

PROGRAM AREA		PERFORMANCE VARIABLE	PERFORMANCE MEASURE
INFORMATION SERVICES	REFERENCE SERVICES	Policy Effectiveness	Percent of reference questions answered by reference collection
		Operations Effectiveness	User satisfaction with accuracy of reference services User satisfaction with timeliness of response (or lag time in receiving response)
		Accuracy	Percent of reference questions answered correctly
		Timeliness	Lag time of literature searches Lag time between receipt of question and response Percent of reference questions answered within users' time limits
INTERINSTITUTION EXCHANGE & LOAN	DIRECTIONAL SERVICES	Operations Effectiveness	User satisfaction with directional services, library maps, signs, etc.
		Accuracy	Error rate of directional transactions
	BORROWING SERVICES	Policy Effectiveness	Median number of days materials received through ILL are overdue from users
		Operations Effectiveness	Percent of requests filled through first channel queried
		Timeliness	Lag time from patron request to user pick-up of requested material. Sub-elements are: - Lag time from patron request to time of issuing request to potential lending library - Lag time from issue of request to receipt of material - Lag time from user notification to material pick-up Percent of requests filled within time requirements established by user Percent of requests filled within X days after receipt of request (time period established by library objective) User satisfaction with timeliness
	LENDING SERVICES	Policy Effectiveness	Percent of requests for materials through ILL compared to all materials circulating
		Timeliness	Lag time from receipt of request to response (yes/no) Lag time from receipt of request to sending material to requesting library
MATERIALS ACQUISITIONS	COLLECTION DEVELOPMENT	Policy Effectiveness	Percent of recommended undergraduate core collections possessed by subject area Percent of items on appropriate annual "good book" lists and award lists acquired monthly
		Operations Effectiveness	Number of order requests by users for materials already on order or in collection (overall and by area) Percent of items for which reorders are needed to acquire multiple copies
	SEARCHING/VERIFICATION	Operations Effectiveness	Percent of order requests which are not verified
		Accuracy	Error rate of verification
		Timeliness	Lag time from order request to completed verification
	ACQUISITION SERVICES	Budgetary Control	Percent of materials acquired at less than publisher's state price
		Timeliness	Lag time from selection of materials to be ordered to transmission of order Lag time in reviewing approval plan materials
MATERIALS ORGANIZATION & CONTROL	CATALOGING SERVICES	Accuracy	Error rate of catalog records Percent of total collection recataloged due to inaccuracy
		Timeliness	Number of days required to catalog the backlog at a point in time Median/modal days between receipt of materials and completion of cataloging activities Percent of items requested while in cataloging process
	PERIODICAL CHECK-IN	Accuracy	Error rate of check-in records
		Timeliness	Median/modal days between receipt of materials and completion of check-in activities Number of days required to check-in backlog at a point in time
	CATALOG MAINTENANCE/PRODUCTION	Accuracy	Percent of entries in catalog for which items are missing or have been lost or withdrawn
		Timeliness	Lag time from record production to insertion in catalog
MATERIALS PREPARATION/PRODUCTION	BINDERY AND REPAIR	Operations Effectiveness	Percent of items bound returned for rebinding, mending or repair within a state period of time
		Timeliness	Number of days required to bind backlog Median/Modal days from removal of materials from circulation for binding until returned to use
	PHYSICAL PROCESSING	Timeliness	Percent of items for which time for physically processing (from cataloging to shelving) is greater than a stated target Median/modal elapsed time for physical processing Number of days required for shelving backlog

APPENDIX E
FINANCIAL REPORT

SUMMARY BUDGET AND EXPENDITURES THROUGH AUGUST 31, 1977

	<u>Budget</u>	<u>Total Previously Reported</u>	<u>Expenditures this period</u>	<u>Total Expenditures through 8/31/77</u>	<u>Unexpended Balance</u>
<u>USOE</u>					
Salaries & Benefits	\$32,877.00	\$23,479.95	\$9,397.05	\$32,877.00	\$ -0-
Consultants, Advisory Board & Evaluator	10,620.00	6,492.04	6,192.39	12,684.43	(2,064.43)
Staff Travel	2,400.00	2,043.54	1,360.96	3,404.50	(1,004.50)
Communications	1,410.00	386.14	577.40	963.54	446.46
Computer	2,675.00	8.33	44.20	52.53	2,622.47
Indirect Cost	9,018.00	6,440.55	2,577.45	9,018.00	-0-
Total USOE	<u>\$59,000.00</u>	<u>\$38,850.55</u>	<u>\$20,149.45</u>	<u>\$59,000.00</u>	<u>\$ -0-</u>

<u>Matching Funds</u>					
Direct Costs	\$13,503.00				\$3,508.57
Salaries & Benefits			\$3,901.55	\$3,901.55	
Travel			2,047.60	2,047.60	
Rent		951.52	291.28	1,242.80	
Supplies		143.84	100.62	244.46	
Copying		624.42	552.40	1,176.82	
Publications		352.24	4.50	356.74	
Meeting Expense		104.32	223.48	327.80	
Other Expense		393.90	302.76	696.66	
Indirect Cost	4,225.00	3,895.22	5,101.46	8,996.68	(4,771.68)
Total Match. Funds	<u>\$17,728.00</u>	<u>\$6,465.46</u>	<u>\$12,525.65</u>	<u>\$18,991.11</u>	<u>\$(1,263.11)</u>

APPENDIX F
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